

Quality of life of individuals with and without facial feminization surgery or gender reassignment surgery

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Abstract

Objectives To determine the self-reported quality of life of male-to-female (MTF) transgendered individuals and how this quality of life is influenced by facial feminization and gender reassignment surgery.

Methods Facial Feminization Surgery outcomes evaluation survey and the SF-36v2 quality of life survey were administered to male-to-female transgender individuals via the Internet and on paper. A total of 247 MTF participants were enrolled in the study.

Results Mental health-related quality of life was statistically diminished ($P < 0.05$) in transgendered women without surgical intervention compared to the general female population and transwomen who had gender reassignment surgery (GRS), facial feminization surgery (FFS), or both. There was no statistically significant difference in the mental health-related quality of life among transgendered women who had GRS, FFS, or both. Participants who had FFS scored statistically higher ($P < 0.01$) than those who did not in the FFS outcomes evaluation.

Conclusions Transwomen have diminished mental health-related quality of life compared with the general female population. However, surgical treatments (e.g. FFS,

GRS, or both) are associated with improved mental health-related quality of life.

Keywords Facial feminization surgery · MTF transgender · Quality of life · Gender reassignment surgery

Introduction

Transgender is an inclusive term that describes a self-identification of a gender, which is incongruent with the assigned gender given to that individual at birth based on physical characteristics or genetic make-up. The term includes transsexuals and cross-dressers. Transsexual typically describes someone who uses hormones or surgery to better align their self-identification of gender with their physical characteristics of gender. A cross-dresser is someone who wears clothes of a gender different from their assigned birth gender. A male-to-female transgender person (i.e., transgender woman or transwoman) is identified at birth as male but psychologically identifies with the female gender regardless of whether or not she receives medical or surgical treatment.

The DSM-IV identifies the disorder associated with the medical incongruity between birth sex and psychological gender as gender identity disorder (GID). The diagnosis of gender identity disorder requires a strong and persistent cross-gender identification, a persistent discomfort with an assigned sex and its associated role, absence of a physical intersex condition (e.g., androgen insensitivity syndrome), and clinical evidence of impairment in social, occupational, or other areas of functioning [2]. Many surgical and non-surgical therapies are available for transwomen. These include psychotherapy, hormonal treatments, gender reassignment surgery (GRS), and facial feminization surgery

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(FFS). This paper focuses on the impact of surgical therapy, in particular FFS, on the quality of life of transgender women.

Gender reassignment surgery (GRS), also known as sexual reassignment surgery (SRS), is a term used to describe a set of procedures by which the physical appearance and function of primary sex characteristics (e.g., penis or vagina) are surgically altered to resemble that of the opposite sex. Facial feminization surgery (FFS) is a set of surgical procedures that alter the typically male facial features to provide a more feminine appearance. FFS procedures can include common facial plastic procedures like brow lift, rhinoplasty, cheek implantation, and lip augmentation. However, other procedures, including scalp advancement, frontal cranioplasty, and reduction mandibuloplasty, are more unique to FFS [9]. The overall goal of FFS is to better align the facial features of gender with the inward identification of gender.

Transgender research has mainly focused on the post-surgical satisfaction of individuals undergoing GRS. Since the earliest published account of GRS in 1931, there have been a few small studies demonstrating its improvement on quality of life [4, 5, 7, 8]. Only one small study describing the results of FFS has been published [3]. In this qualitative study, mandibular angle reduction, genioplasty, bimaxillary osteotomies, and zygoma reconstructions were used to alter the masculine facial appearance. The study concluded that although all sixteen patients reported satisfaction in their surgical outcomes, the authors were unable to determine the life impact of FFS on the lives of transwomen.

The first study to more broadly examine the physical and mental quality of life of transgender individuals was reported by Newfield in 2006. In this study, female-to-male (FTM) transgender individuals (i.e., transgender men) were given a validated quality of life survey, the SF-36v2. Transgender men receiving treatment were compared to those not receiving treatment and the general US population. The study found a statistically significant ($P < 0.01$) diminished quality of life among transgender men compared to the US male and female population. Perhaps more importantly, the study discovered that participants who received testosterone therapy reported a statistically significant higher quality of life score ($P < 0.01$) than those not receiving hormone therapy [6].

Our goals were to assess the quality of life of transgender women (both those with surgical intervention and those without) and compare their quality of life to the general female population. We hypothesized that transwomen without treatment will have lower quality of life scores compared to those of the general population and that those who have received surgical intervention (i.e., GRS, FFS, or both) will have higher quality of life scores than transwomen who have not had surgery.

Methods

MTF transgendered persons with or without prior gender confirming surgery self-administrated a survey provided via the Internet at a specifically created website, or in person. Potential subjects were invited to visit a secured survey at a constructed website, but could also take the survey in person. In person surveys were provided on paper to potential subjects visiting a transgendered health conference in 2007.

A comprehensive survey that combined three separate evaluations into one was prepared and approved by the Institutional Review Board at Boston University School of Medicine. This survey was constructed by serially attaching several different survey tools into one longer, but relevant survey instrument. In essence, the subjects were asked to respond to three shorter evaluations simultaneously. The comprehensive survey included a demographic portion, a facial feminization outcomes evaluation, and a standardized quality of life measure. The demographic portion collected data on age, length of transition/transitioning, type of surgery (e.g., FFS, GRS), use of hormones, plans for future plastic surgery, and a ranking of the parts of the face MTF women felt were most significant in being perceived as feminine.

The facial feminization outcomes evaluation was adapted from a facial plastic surgery outcomes evaluation previously published [1]. Similar to other outcomes evaluations, the FFS outcomes evaluation is a six-question survey that assesses the physical, emotional, and social domains of patient satisfaction after plastic surgery. Each question presents a scale of five answers with the most negative response given a value of zero and the most positive response given a value of 4. The scaled instrument score for the outcomes evaluation is calculated by dividing the summation of the total score for each instrument by 24 and then multiplying that answer by 100. The resulting instrument score is between zero and one hundred with zero being the least and one hundred the most satisfied (See Fig. 1). We used a sample *t*-test assuming equal variances to compare the mean scores for FFS participants and non-FFS participants with statistical significance set at $\alpha = 0.05$.

The San Francisco short 36-question health questionnaire (SF36v2) was used as the standardized quality of life measure. The SF36v2 yields eight domain and two-component summary scores. Table 1 provides a definition of the eight domains, physical component summary, and mental component summary. Additionally, the questionnaire yields a composite physical and mental health summary score. The questionnaire is a generic measure that has been validated and utilized in multiple published studies, including one recently examining quality of life in female-

Fig. 1 Facial feminization surgery outcomes evaluation**Facial feminization surgery outcomes evaluation**

I like the appearance of my face.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4
The appearance of my face is feminine.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4
My friends and loved ones perceive my face as feminine.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4
My current facial appearance limits my social activities.				
Never	Rarely	Sometimes	Usually	Always
4	3	2	1	0
My current facial appearance limits my professional activities.				
Never	Rarely	Sometimes	Usually	Always
4	3	2	1	0
In public I am confident my facial appearance is perceived as feminine.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4
I would like to alter the appearance of my face.				
Not at all	Probably not	Possibly	Most likely	Definitely
4	3	2	1	0
Facial feminization surgery is/was important to my ability to live as a woman.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4
Body surgery is/was important to my ability to live as a woman.				
Not at all	Somewhat	Moderately	Very Much	Completely
0	1	2	3	4

to-male transgender individuals. The SF36v2 uses a norm-based scoring system that incorporates 1998 general population health norms obtained from a National Survey of Functional Health Status. The survey used the SF36v2 health survey to sample households that were balanced demographically according to US census regions [10]. Sampling weights were applied to adjust the participants to age and gender distributions of the 1998 census. Each of the eight domains and the two-component summary scores has a mean of 50 with a standard deviation of 10 [10]. FFS only, GRS only, FFS and GRS, and non-surgery participants were compared to the 1998 general population using sample *t*-tests with statistical significance set at $\alpha = 0.05$.

Results

Demographic characteristics of participants are provided in Table 2. The majority of participants who underwent surgery were taking hormones (86% FFS only, 100% GRS only, and 98% both FFS and GRS) compared to those who did not (66%). Hormone therapy may have had an effect to the reported quality of life of our sample (FFS, GRS, and both FFS and GRS participants).

The facial outcomes evaluation demonstrated a significant difference ($P < 0.01$) between those participants who have had facial feminization surgery and those who have not. The mean value for participants who have had FFS was 76 (standard deviation (SD) 17.7) compared to 44 (SD 15.7) for those who have not had FFS. This suggests a more satisfactory quality of life outcome in regard to physical, mental, and social functioning following FFS than without such surgery (Tables 3, 4).

In the SF36v2, the mental component summary (MCS) scores for all participant groups that had GRS, FFS, or both (GRS only mean 49.3 (SD 9.5), FFS only mean 50 (SD 8.9), both FFS and GRS mean 49.2 (SD 7.5)) are not significantly different than the MCS scores of general female population (mean 48.9 (SD 10)). However, transwomen without surgical intervention had statistically significant ($P < 0.05$) lower mental health scores compared to the mental health scores for the general female population (mean 39.5 (SD 7.3) compared to mean 48.9). The mental health quality of life of transwomen without surgical intervention was significantly lower compared to the general population, while those transwomen who received FFS, GRS, or both had mental health quality of life scores not significantly different from the general female population.

Table 1 SF36v2 component summary and domain scales definitions and sample questions

SF36v2 component summary or domain scale	Definition	Sample question
Physical component summary	An overall physical assessment of well-being determined by all eight domains (physical functioning, role-physical, and bodily pain contributing most)	See domain scales
Mental component summary	An overall psychosocial assessment of well-being determined by all eight domains (mental health, role-emotional, and social functioning contributing most)	See domain scales
Physical-functioning domain scale	Evaluates the presence and severity of limitations to physical activities	Does your health now limit you in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
Role-physical domain scale	Assesses the limitations to work or other daily activities	During the past 4 weeks, how much of the time have you had any of the following problems (i.e., accomplished less than you like) with your work or other regular daily activities as a result of your physical health?
Bodily pain domain scale	Determines the impact pain on daily activities	How much bodily pain have you had during the past 4 weeks?
General health domain scale	Determines overall sense of well-being	How True or False is the following statement for you: I seem to get sick a little easier than other people.
Vitality domain scale	Evaluates the influence of health on energy level and fatigue	How much of the time in the past 4 weeks did you feel worn out?
Social-functioning domain scale	Measures the impact of health on engaging in social activities	During the past 4 weeks, to what extent have you had physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
Role-emotional domain scale	Assess the impact of emotional problems performing daily activities	During the past 4 weeks, how much of the time have you had any of the following problems (e.g., accomplished less than you would like) with your work or other regular daily activities as a result of any emotional problems
Mental health domain scale	Evaluates the presence or severity of mental health indicators (e.g., anxiety, depression)	How much of the time in the past 4 weeks have you been happy?

Table 2 Demographic data

	Mean age	Taking hormones	Transition <1 year	Transition 1–5 years	Transition 6–10 years	Transition >10 years
FFS-Yes; GRS-No (28)	51	24 (86%)	2 (7%)	19 (68%)	1 (4%)	5 (18%)
FFS-No; GRS-Yes (25)	50	25 (100%)	0 (0%)	6 (24%)	8 (32%)	11 (44%)
FFS-Yes; GRS-Yes (47)	49	46 (98%)	0 (0%)	18 (38%)	13 (28%)	16 (34%)
FFS-No; GRS-No (147)	46	97 (66%)	39 (27%)	68 (46%)	18 (12%)	18 (12%)

Discussion

Transwomen often endure significant emotional turmoil and distress related to the incongruence between their internal and external manifestations of gender. In the process of transitioning to life as women, they can experience isolation from friends and family. The social impact of transition can include ostracization from both work and personal environments. This can include loss of job, home, and social support groups. It is not uncommon for these

women to suffer from depression, anxiety, or suicidal tendencies. As a result of the need to minimize the social impact of their transition, the ability to be seen by others as women becomes of the utmost importance. With this understanding of the transgendered woman, we sought to objectively compare the quality of life of transgender women to the general population.

Of the 247 study participants, those without surgical feminization (either GRS or FFS) had significantly poorer mental health-related quality of life compared to the 1998

Table 3 SF36v2 component summary and domain scale score

	Physical component summary (PCS) Mean (SD)	Mental component summary (MCS) Mean (SD)	Physical function Mean (SD)	Role-physical Mean (SD)	Bodily pain Mean (SD)	General health Mean (SD)	Vitality Mean (SD)	Social function Mean (SD)	Role-emotional Mean (SD)	Mental health Mean (SD)
1998 general population-females	49 (9.8)	48.9 (10.0)	48.6 (10.0)	49.1 (9.7)	49.1 (9.6)	49.4 (9.6)	48.8 (9.5)	49.1 (9.8)	49 (10.0)	48.9 (9.8)
FFS-Yes; GRS-No	56.4* (10.1)	50 (8.9)	52.7* (7.8)	54.8* (5.7)	56* (7.8)	54.8* (8.2)	54.6* (9.4)	50.4 (6.8)	50.8 (8.5)	51.7 (7.7)
FFS-No; GRS-Yes	53.5* (9.4)	49.3 (9.5)	51.9* (14.8)	52.6 (2.6)	53.4* (5.6)	50.9 (8.0)	51.8 (8.3)	49 (6.4)	50 (7.2)	50.7 (7.3)
FFS-Yes; GRS-Yes	54.8* (7.9)	49.2 (7.5)	53.7* (7.4)	52.9* (4.6)	53.6* (6.8)	54.2* (6.0)	54.6* (9.8)	49.1 (5.1)	50.4 (8.6)	49.7 (5.9)
FFS-No; GRS-No	57.4* (8.1)	39.5* (7.3)	53.7* (9.8)	53* (5.1)	54.1* (7.5)	51.5 (7.5)	47.8 (10.5)	44.2* (6.2)	43* (8.1)	42.1* (7.3)

* $P < 0.05$ when compared to general female population

Table 4 FFS outcome evaluation scores

	Mean value (SD)	95% confidence interval
FFS-Yes ($n = 75$)	76* (17.7)	4
FFS-No ($n = 172$)	44.3* (15.7)	2.4

* P -value < 0.01

general female population. However, transwomen who had GRS, FFS, or both were associated with a higher mental health-related quality of life than their non-surgical counterparts. Indeed the MCS of transwomen with surgical intervention of any sort is not significantly different to that of the general population. While, not conclusive of a direct effect, this suggests the possibility that feminizing surgery can positively impact the mental health-related quality of life of transwomen.

The study also found a statistically significant higher physical-related quality of life compared to the 1998 general female population among all four transwomen groups. The three domains contributing most to the PCS are physical function, role-physical, and bodily pain. In two of the domains (i.e., physical function and bodily pain), all four study groups have statistically higher scores compared to the general population. In the bodily domain category, only one study group (i.e. GRS only) had a score that was not statistically higher than the general population. The significance of greater physical health-related quality of life is unknown. The burden of chronic disease in transwomen participants is unknown. It may be that the general population has a greater burden of chronic or acute disease than our study participants.

Among the domain scores in the SF36v2, the social function domain score was significantly lower (mean 44.2, SD 6.2) in the non-surgical transwoman compared to the

general female population (mean 49.1), GRS only (mean 49, SD 6.4), FFS only (mean 50.4, SD6.8), and both GRS and FFS (mean 49.1, SD 5.1) groups. Most of the internal conflict and distress resolves around the inconsistent physical appearance and its social implications. It is therefore not surprising that those without surgical alteration of their physical appearance suffer more in the impact of their health on social activities (e.g., activities with family, friends, or neighbors). These results indicate that FFS, GRS, or both may have a substantial impact on a transwoman's ability to engage in social activities without limitations.

The FFS outcomes evaluation demonstrates a highly statistically significant difference ($P < 0.01$) in the mean value among those participants that had received FFS (mean 76, SD17.7) and those did not (mean 44.3, SD 15.7). The closer the mean value approaches 100, the greater the satisfaction. The purpose of creating the FFS outcomes evaluation was to determine a FFS-specific quality of life indicator. The outcomes evaluation aims to evaluate the success of a surgical outcome by relating it to the impact in physical, social, and emotional domains of a person's life. One limitation of the outcomes evaluation is that it has not been validated by prior investigations. The facial plastic surgery outcomes evaluations were designed as pre-operative and post-operative evaluations of the same patient undergoing facial plastic surgery. In order to accumulate a large group of transwomen with a variety of experiences in transgender medical services, we included those participants that did not have FFS as a comparison for those who had FFS. Perhaps the most significant finding of this survey has been to demonstrate the potential benefit of facial feminization to transgendered patients. Indeed the individual's perception of success in achieving a more feminine face is more important than any objective evaluation of acceptable cosmesis.

Limitations of the overall survey include potential misclassification bias. Participants were asked to complete the survey if they identified themselves as a transgender woman. While there is a potential for individuals to falsify their identity, we believe this likelihood is low. It should be remembered that the term transgender is an all-encompassing term that includes individuals in a variety of points in their transition. As a result of recruitment efforts, only individuals who either received care from a FFS surgeon or clinic or were involved with transgender support groups or organizations were asked to complete the survey. This is an important point because transgender women who are early in their transition may not be well connected to support groups or physicians who specialize in transgender services. The quality of life of these transwomen is not well represented by this study. We also did not collect data on the medical co-morbidities of our participants. We therefore are unable to conclude whether our patients suffered more medical co-morbidities than the 1998 general female population. The concern is that those with increasing number of debilitating medical co-morbidities have lower quality of life scores than their counterparts. However, given the higher scores in physical component scores in all transwomen groups, we can assume this possibility is low.

In conclusion, the study provides valuable information on the quality of life of transgender women when compared to the general population. In the first study of its kind, we are able to compare transwomen who have had FFS only, GRS only, and both FFS and GRS to transwomen without surgical intervention and the general population. Our findings that mental health-related quality of life is lower in transwomen without surgery compared to those who have had surgery is not conclusive of a direct positive effect of surgery, but it is significant with potential

implications for improving the overall health status of this group of individuals.

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